BREASTFEEDING DURATION: A DESCRIPTIVE STUDY OF WOMEN RECEIVING LEVONORGESTREL INTRAUTERINE SYSTEM IMMEDIATELY AND 6 WEEKS POSTPARTUM

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Abstract:

Objectives: Describe and compare the characteristics and breastfeeding duration of women receiving levonorgestrel intrauterine system (LNG-IUS) immediately postpartum and 6 weeks postpartum
Methods: This was a secondary data analysis of a completed randomized clinical trial. Women desiring a LNG_IUS postpartum were randomized to early post-delivery insertion or late insertion 6–8 weeks after vaginal delivery. Breastfeeding status was assessed at 6 weeks, 3 months, and 6 months postpartum. Only women with continuous use of an IUS were included in this analysis.
Results: Twenty-two women (7 early insertions, 15 late insertions) were included in this analysis. Seventeen (77.3%) and 13 (59.1%) of the women continued breastfeeding through 6 weeks and 6 months respectively. Women with longer durations of breastfeeding showed a trend toward being older, having higher income and stronger intention to breastfeed. Women with shorter durations of breastfeeding showed a trend toward being non-white. The rate of breastfeeding was slightly higher among continuous IUS users who received the IUS early after vaginal delivery, compared to the late group, at 6 weeks and 6 months but the difference was not significant.
Conclusions: Among a group of women who received and used the LNG-IUS continuously either immediately after a vaginal delivery, or 6 weeks later, breastfeeding outcomes were similar. Many published trends in determinants of breastfeeding duration were seen among women receiving an LNG-IUS postpartum. There did not appear to be a difference in the breastfeeding duration of continuous users in the early insertion group compared to the late insertion group. The relationship between type and timing of postpartum contraception and breastfeeding should be explored further.

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Introduction:

Breastfeeding has health benefits for mothers and infants. Breastfeeding decreases maternal risk for breast and ovarian cancer, cardiovascular disease and diabetes. It also provides immunologic protection to infants, decreasing risk of lower respiratory infections, asthma and diabetes.[1,2] The American College of Obstetricians and Gynecologists and the American Academy of Pediatrics recommends six months of exclusive breastfeeding.[2,3] Rates of initiation of breastfeeding in the United States have increased over the last decade. The CDC National Immunization Survey found that 77% of mothers of babies born in 2009 initiated breastfeeding, which met the goal for the Healthy People 2010 initiative of a 75% breastfeeding initiation rate. Unfortunately, increased breastfeeding initiation rates have not matched increased breastfeeding duration. Rates of any breastfeeding and exclusive breastfeeding at 6 months remain low at 48% and 16% respectively. [4]

Many demographic, biological and psychological factors are associated with duration of breastfeeding. Race has been found to be a strong predictor of breastfeeding, with black women less likely to breastfeed than non-black women.[5] Increased maternal age and higher income have also been found to be associated with increase rates of breastfeeding and longer breastfeeding duration.[6,7] Biological variables associated with shorter breastfeeding duration include insufficient milk supply, physical challenges of breastfeeding, infant health problems, maternal obesity and maternal smoking.[8,9] Psychological variables associated with breastfeeding duration include antenatal maternal feeding intention, maternal confidence in ability to breastfeed and maternal

depression.[8,10–12]

Initiation of a highly effective contraceptive method postpartum can also have significant health benefits for mothers, children and families by preventing unintended pregnancy as well as by lengthening the birth interval. Repeat births within 6 months are associated with increased risk of adverse maternal outcomes including death, third trimester bleeding and premature rupture of membranes. Repeat births within 18 months are associated with increased risk of poor perinatal outcomes including preterm birth and small for gestational age [13,14].

While lactation can be an effective form of short-term contraception, because the return to menstruation and ovulation in breastfeeding women can be difficult to predict, other contraceptive options are still important to consider. Postpartum women intending to breastfeed may have reduced or delayed contraceptive initiation of due to concerns about the interaction between contraceptive methods and breastfeeding. There is limited and sometimes conflicting data about the impact of contraception on successful breastfeeding and data is particularly limited regarding progestin-only birth control methods.[15] Recent randomized control trials have suggested that neither progestin-only-pills nor progestin containing implant do not impair breastfeeding.[16,17] However the relationship between the levonorgestrel-releasing intrauterine system (LNG-IUS), timing of insertion, and breastfeeding success remains less clear.

This relationship must be explored further in order to provide to physicians and their patients adequate information for making decisions and maximizing possible health benefits for both mother and child. The primary objective of this study is to describe and

compare the characteristics and breastfeeding duration of women who received, and used continuously, the levonorgestrel intrauterine system (Mirena®; LNG-IUS) immediately after an uncomplicated vaginal delivery and 6 weeks postpartum. The results, which use comparative statistics, are meant to identify relationships that should be investigated in future studies to help women who intended to breastfeed and their physicians determine appropriate postpartum timing and methods of contraception.

Methods:

Design

This was an analysis of a subgroup of women enrolled in a clinical trail "Levonorgestrel intrauterine system after vaginal delivery and breastfeeding: A randomized trial." The primary study was a parallel, randomized clinical trial with 1:1 allocation comparing early vs. late postpartum insertion of the LNG-IUS. The women allocated to the early arm received an LNG-IUS within 48 hours of vaginal birth, and those allocated to the late arm received their LNG-IUS four to six weeks after vaginal birth. Neither participants nor investigators were blinded. The study was approved by the University of North Carolina Institutional Review Board and was registered at Clinicaltrials.gov (NCT 01555931). The present analysis is a sub-study of one group the women who received, and used continuously, the LNG-IUS allocated to them at the time of randomization.

For the primary study, women were recruited from antepartum clinics and the labor and delivery unit at the North Carolina Women's Hospital, which includes faculty and resident practices. The hospital serves the surrounding community and is a tertiary referral center with 3500-4000 births annually and a cesarean rate of 32%. The North

Carolina Women's Hospital received designation as a Baby Friendly Hospital during the study period. International Board Certified Lactation Consultants provide 24-hour in-house breastfeeding support.

Eligibility was determined before and after delivery. Pre-delivery criteria included: age 18-45 years; current pregnancy ≥24 weeks estimated gestational age; anticipated vaginal delivery; no history of caesarean delivery; fluency in English or Spanish; HIV negative status. To be eligible women had to state intention to breastfeed and to use the LNG-IUS postpartum. Additional eligibility criteria included no allergies to any component of the LNG-IUS; no known uterine anomalies; no known or suspected uterine or cervical neoplasia; no history of ectopic pregnancy; no known or suspected carcinoma of the breast; and no known acute liver disease or liver tumor. The women who met all eligibility criteria signed consent forms. After 3 months of recruiting we changed our breastfeeding intention criteria. Evaluation of slow enrollment revealed that intent to breastfeed for six months was a barrier. Therefore, we changed the eligibility criteria to include intent to breastfeed for any duration.

After delivery, women were reassessed and additional eligibility criteria applied: vaginal delivery; membranes ruptured for less than 24 hours prior to delivery; no endometritis or chorioamnionitis; no cesarean delivery; no fever greater than or equal to 38°C during the intrapartum or postpartum period; no receipt of medications other than pitocin or misoprostol to control postpartum bleeding; no documented estimated blood loss of greater than 750mL; no blood transfusion for a diagnosis of postpartum hemorrhage; and no cervical or third or fourth degree laceration at delivery. To achieve the highest likelihood of enrolling women and infants who would have success

breastfeeding infant criteria included: estimated gestational age at birth greater than 35 weeks as determined by physical exam at birth; weight at least 2727 grams (6 pounds); and singleton birth. Additionally, the infant must not have been transferred to the intensive care nursery directly from the delivery room nor could the infant be diagnosed with a condition that would preclude long-term breastfeeding. Women who met all post-delivery criteria were offered entry into the randomized trial. All others were referred to their primary physician for routine care and contraceptive counseling.

Randomization was achieved by computer-generated randomly varied block sizes of 4 and 6. The randomization list and allocation envelopes were prepared by persons unrelated to the study. Allocation concealment was maintained by placing method indicator labels on 8 1/2" x 11" plain heavy white paper. At randomization the research assistant opened the next sequentially numbered envelope in front of the participant.

Women allocated to early placement received their LNG-IUS on the postpartum ward. Women allocated to late placement received their LNG-IUS at their postpartum visit by their provider or by a study clinician, using standard insertion techniques. Data were collected in face-to-face interviews at enrollment, immediately postpartum while still in the hospital, 6 weeks, 3 months (10-16 weeks) and 6 months (24-28 weeks) later. One phone call was conducted at 4.5 months (16-20 weeks) to ensure continued participation in the study. Baseline data were collected on demographics, reproductive history, breastfeeding intention and confidence, and postpartum depression. Breastfeeding data post-delivery and at subsequent visits were collected using validated questions for intention (The Infant Feeding Intentions Scale) and confidence (The Breastfeeding Self Efficacy Scale-Short Form).[10,11] Additionally, the Edinburgh

Postpartum Depression Scale was administered at every visit following delivery.[18] Assessment of intrauterine LNG-IUS location was made by physical exam to check for the strings or by ultrasound.

The primary study was stopped early because spontaneous LNG-IUS expulsion after immediately post vaginal delivery insertion reached 47%, which met a-priori stopping criteria.

Sample justification

The sample used in this analysis was limited to women who received their allocated LNG-IUS according to study protocol, had continuous use of the LNG-IUS through the study period and provided breastfeeding status information for 6 weeks and 6 months.

Analysis

Descriptive statistical analysis techniques were used to describe the characteristics and breastfeeding statuses of women receiving and continuously using LNG-IUS post partum and identify relationships that can inform and guide future research on an association between immediate postpartum contraception and breastfeeding. Comparative analysis of timing of device insertion, and breastfeeding and population characteristics were conducted using Fisher's exact test or Wilcoxon Rank-sum. Kaplan-Meier curves and log-rank tests were used to analyze the time to discontinuation of breast-feeding. All statistical analysis was performed using STATA 13.0 software.

Results:

One hundred-forty-seven women were screened between February 1 and November 30, 2012. Sixty-one women enrolled into the antepartum cohort. Of the 86

women who did not enroll, 69 (80%) did not meet eligibility requirements and 17 (20%) declined to participate. Of the 61 women enrolled in the baseline cohort, 35 (57%) women met post-delivery eligibility criteria and were entered into the randomized clinical trial. The 26 excluded women had medical conditions at delivery that precluded trial participation (N=14), declined further participation in the study (N=6), or delivered at an outside hospital (N=4). Two deliveries were missed by the study staff. Seventeen women were allocated to the early group and 18 were allocated to the late insertion group.

Fifteen of the 17 women in the early group, and 15 of the 18 women in the late group had an LNG-IUS successfully inserted according to their allocation. In the early group, the median number of hours between delivery and placement was 21.5 (interquartile range 10, 27) and the median uterine size at placement was estimated at 20 weeks gestation [interquartile range 18, 20].

Of the 17 women allocated to early insertion, 15 women left the hospital with an LNG-IUS in place. Insertion was unsuccessful in two women due to inability to reach the fundus. Only nine of the 17 women (53%) allocated to early insertion had their originally placed LNG-IUS in utero at the 6 week study visit. Five women had an expulsion (29%), and three had their LNG-IUS removed (18%). Because of the poor continuation rate, the DSMB and principal investigator conducted a review. Given that only 53% of the 17 attempted LNG-IUS placements were still in place at six weeks, the study DSMB and the PI concluded that research equipoise was lost. Therefore, the study was stopped.

Ultimately 22 continuous users of the IUS (7 from the early group and 15 from the late group) were included in the analysis sample. Seventeen of the 22 women (77%) were breastfeeding at 6 weeks post delivery, while the remaining 5 had discontinued prior to that time point. Thirteen women (59%) were still breastfeeding at 6 months post delivery and 9 had discontinued breastfeeding.

Patient baseline and demographic characteristics are described in Table 1, disaggregated by breastfeeding status at 6 weeks and 6 months. Women who were breastfeeding at 6 weeks showed a trend toward being older than women who discontinued breastfeeding at the same time point (median age 29 years compared to 23 years). This trend was significant at 6 months as well but with a smaller age difference. Fifteen (68.18%) of the women in the sample identified as white, 4 (18.18%) as Hispanic or Latina, 2 (9.09%) as black, and 1 (4.55%) as another race/ethnicity. While the majority of the sample was white, black and Hispanic women were overrepresented among the women who discontinued breastfeeding at 6 weeks. This trend is also seen at the 6 months postpartum. Approximately half of the women in the sample (52%) had a monthly household income below $3000 a month. All of the women who had discontinued breastfeeding at 6 weeks were in this lower income group. At 6 months, 75% of women who had discontinued breastfeeding, and only 38.5% of those who continued breastfeeding were in the lower income group.

As seen in Table 2, breastfeeding status at 6 weeks and 6 months also varied by a woman's strength of intention to breastfeed and expected duration of breastfeeding. The Infant Feeding Intentions (IFI) scale quantitatively assesses both the strength of intentions to breastfeed and intended duration. The scale uses participants ratings of their

agreement the statements, "I am planning to only formula feed my baby," and "I am planning to at least give breastfeeding a try," along with statements about breastfeeding at 1, 3 and 6 months (See appendix for full scale). Scores range from 0 (very strong intention to not breastfeed at all) to 16 (very strong intention to breastfeed exclusively throughout the first 6 months).[11] Overall, the women in this sample had high intention to breastfeed, with IFI scores ranging from 8 to 16 and 20 scores between 12 and 16. But women who were breastfeeding at 6 weeks and 6 months had higher median IFI scores (both 16) than women who had discontinued breastfeeding at 6 weeks and 6 months (12 and 12.5 respectively). This trend was mirrored in the reported anticipated age of the baby at breastfeeding cessation, with women who breastfeed longer having a higher median intended duration of breastfeeding. Women's answers were concentrated around 26, 52 and 78. The median anticipated age of baby at breastfeeding cessation of women breastfeeding at 6 weeks and 6 months was 52 weeks compared to 26 weeks among the women who had discontinued breastfeeding at each time point.

Women's confidence in breastfeeding was measured using the Breastfeeding Self-Efficacy Scale (BFSES)- Short form. The scale is a sum of confidence levels of 14 aspects of breastfeeding, with higher scores indicating higher levels of breastfeeding self-efficacy (See appendix for full scale).[10] As seen in Table 2, when measured just prior to discharge from delivery, women's reported breastfeeding confidence was not associated with breastfeeding status at 6 weeks or 6 months. However, when measured at 6 weeks, women who were still breastfeeding at that time did show a trend toward higher confidence in breastfeeding than those who has discontinued breastfeeding at 6 weeks and 6 months. The median difference between the BFSES while at the hospital post-

delivery and 6 weeks post partum was an 11 point increase for women who were still breastfeeding and a 12 point decrease for women who had discontinued breastfeeding at 6 weeks.

Six of 7 (85.71%) participants with early IUS insertions were breastfeeding at 6 weeks compared to 11 of 15 (73.33%) participants with late IUS insertions (See Table 3). Five of 7 (71.43%) participants with early IUS insertions were breastfeeding at 6 months. Eight of 15 (53.33%) participants with late IUS insertions were breastfeeding at 6 months. The factors identified in the previous section that appeared to vary with breastfeeding status at 6 weeks or 6 months did not vary with randomization. When using the log-rank test to analyze the time to discontinuation of breastfeeding, we fail to reject the null hypothesis that the survival curves for the two groups depicted in Figure 1 are different; The timing of IUS insertion did not seem to be associated with rates of breast-feeding discontinuation in this sample of continuous IUS users (p=.43). These results did not change with intent-to-treat analysis of all 35 women randomized in the study.

Discussion:

This study illustrates the breastfeeding duration and characteristics of women continuous users of LNG-IUS, receiving the device immediately after vaginal delivery and 6-weeks post-delivery. This data reflected some of the established trends in breastfeeding duration. Women with longer duration of breastfeeding showed a trend toward being older, having higher income, and stronger intention to breastfeed. Women with shorter duration of breastfeeding showed a trend toward being non-white. This analysis suggests that some of the same trends in duration of breastfeeding among the

general population are also seen among women using LNG-IUS and that accurate and detailed breastfeeding data can be collected in a contraceptive study. In addition to breastfeeding outcomes, determinants of breastfeeding duration, particularly validated scales such as the Infant Feeding Intentions Scale and the Breastfeeding Self-Efficacy Scale, should be collected in future postpartum contraceptive research. While randomization should control for variation in breastfeeding intention and confidence across study arms, use of these validated scales would allow for confirmation as well as assessment of the magnitude of the influence of breastfeeding intention and confidence on breastfeeding status and duration compared to use of the contraceptive method.

The Kaplan-Meier Survival curves and the log-rank test, though created from a small sample, do not suggest a significant difference in the breastfeeding duration of breastfeeding between continuous users in the early versus late IUS insertion groups. These results contradict the findings of Chen et al. findings, that suggested women who had an LNG-IUs insertion 6–8 weeks postpartum were more likely to breastfeed at 6 months than those who had an IUS inserted immediately after delivery.[19]

However, the rates of breastfeeding in Chen's study were lower overall than the rates reported here. The difference in breastfeeding rates between the two studies is likely due to several factors. Chen's study was not limited to only women who intended to breastfeed and just under half of women in both early and late insertion groups never initiated breastfeeding. Because Chen's study did not include any measure of breastfeeding intention, it cannot be determined if the women in Chen's study wanted breastfeeding but were unsuccessful or never wanted to breastfeed. In future studies,

information about breastfeeding intention should be collected when exploring the relationship between postpartum contraception and breastfeeding.

Even when Chen limited her analysis only to women who initiated breastfeeding, the rates of breastfeeding at 6 months were much lower than what we found. Recruitment for this study occurred at the North Carolina Women's Hospital, which had a Baby-Friendly® Hospital designation from the World Health Organization (WHO) and the United Nation's Children's fund. This designation indicates that the hospital has implemented institutional supports to help women who intend to breastfeeding to successfully reach their goal.[20] Magee-Women's Hospital in Pittsburgh, PA where Chen's study was conducted does not have this designation. Previous literature has shown that hospital policies and support have little influence on the decision to breastfeed but can increase duration of breastfeeding.[6] This may suggest that potential differences in breastfeeding duration due to timing of IUS insertion may be mitigated by strong breastfeeding intention in conjunction with institutional support. This potential mitigating relationship should be explored further.

Previous findings, supported by our experience conducting this randomized control trial, suggest expulsion rates may be higher with early postpartum IUS insertion than with interval insertion.[21,22] As such, immediate postpartum insertion of a LNG-IUS may not be a preferred timing for postpartum contraception unless women are unlikely to return for IUS insertion. However, further research is required to determine whether the desire to breastfeed should be a factor in the timing of IUS insertion.

This study benefited from the use of a rigorous, randomized and controlled design. It also used validated scales to measure important determinants of breastfeeding duration such as breastfeeding intention, confidence and postnatal depression.

This study is limited by a self-reported outcome measure, potential bias due to exclusion of those without continuous use of IUS, and small sample size. Participants may not accurately report breastfeeding status. However differences in self-reports of breastfeeding are unlikely to differ by timing of IUS insertion.

As reported earlier, there were five expulsions and three removals of IUS for medical reasons among the early insertion group. These cases were excluded from this analysis in order to assess the relationship between continuous postpartum use of an IUS and breastfeeding outcomes. However, it is also plausible that device-associated complications that result in expulsion or removal, such as postpartum endometriosis, may influence breastfeeding outcomes. As such, limiting the analysis to continuous users may have biased the results towards seeing no difference in breastfeeding duration due to timing of insertion, when a difference does in fact exist. When an intent-to-treat analysis included all randomized participants, there was still no difference in breastfeeding duration by timing of IUS insertion. However, we cannot determine what the breastfeeding outcomes would have been in the non-continuous users had they had the IUS throughout the study period.

Lastly, due to the early termination of the study, the sample size in this analysis is small. We report a study in which the comparisons employed descriptive statistical analysis. As such, definitive comparative inferences between groups cannot be made. The

relationship between type and timing of postpartum contraception and breastfeeding should be explored further.

Tables and Figures

Table 1:
Baseline and demographic characteristics of women by breastfeeding status at 6 weeks and 6 months, providing median and interquartile range if not otherwise indicated

	Breastfeeding at 6 weeks			Breastfeeding at 6 Months		
	Yes N= 17 77.3%	NO N= 5 22.7%	p	YES N= 13 59.1%	NO N= 9 40.9%	p
Age , years	29 (27, 31)	23 (20,25)	.00	29 (27, 31)	25 (23, 27)	.01
Age of partner, years	31 (29, 35)	27 (25,27)	.02	30 (28, 32)	29 (27, 35)	.52
Gravidity	2 (1, 3)	2 (1, 3)	1.0	2 (1, 3)	2 (1, 3)	.89
Parity	1 (0,2)	1 (0,1)	.93	1 (0,2)	1 (0,1)	.52
Dependents	3 (2,3)	2 (2, 2)	.41	3 (2,4)	2 (2,3)	.36
Race/Ethnicity, n (%)			.02			.01
White, non-Hispanic	14 (82)	1 (20)		12 (92)	3 (33)	
Black, non-Hispanic	1 (6)	1 (20)		0 (0)	2 (22)	
Hispanic or Latina	1 (6)	3 (60)		1 (8)	3 (33)	
Other	1 (6)	0 (0)		0 (0)	1 (11)	
Monthly Household Income, n (%)			.03			.27
$1001-$2000	1 (6)	2 (40)		1 (78)	2 (22)	
$2001-$3000	6 (35)	2 (40)		4 (31)	4 (44)	
>$3000	10 (59)	0 (0)		8 (62)	2 (22)	
Missing	0 (0)	1 (20)		0 (0)	1 (11)	
Employment status prior to delivery, n (%)			.60			1.0
Full-time	11 (65)	2 (40)		7 (54)	6 (67)	
Part-time	2 (12)	1 (2)		2 (15)	1 (11)	
Some of each	1 (6)	0 (0)		1 (8)	0 (0)	
Did not work	3 (18)	2 (4)		3 (23)	2 (22)	
Marital status, n (%)			.10			.20
Single	0 (0)	1 (20)		0 (0)	1 (11)	
Married	14 (82)	2 (40)		11 (85)	5 (56)	
Living with partner	3 (18)	2 (40)		2 (15)	3 (33)	

P-values based on Fisher's Exact test or Wilcoxon rank-sum tests

Table 2:
Immediate postpartum characteristics of women by breastfeeding status at 6 weeks and 6 months postpartum, median and interquartile range

	Breastfeeding at 6 weeks			Breastfeeding at 6 Months		
	YES n=17	NO n=5	*p*	YES n=13	NO n=9	*p*
Infant birth weight, Grams	3570 (3230, 3830)	3351 (3232, 3583)	.67	3570 (3122, 3820)	3376 (2383, 3845)	.62
Infant Feeding Intentions Score[11]	16 (14, 16)	12 (12, 12.5)	.01	16 (15, 16)	12.5 (12, 14)	.01
Planned age of baby at breastfeeding cessation, weeks	52 (52, 52)	26 (26,26)	.04	52 (52, 52)	26 (26, 52)	.04
Edinburgh Postnatal Depression Score[19]	3 (3,5)	2 (1,2)	.11	4 (3,5)	2 (1, 3)	.13
Breastfeeding Self-Efficacy score[10] post-delivery	52 (46, 64)	47 (38, 62)	.40	52 (42, 56)	51 (47, 64)	.84
Breastfeeding Self-Efficacy score[10] 6 weeks postpartum*	57 (51, 67.5)	50 (19, 57)	.15	65 (55.5, 68.5)	50 (33, 51)	.00

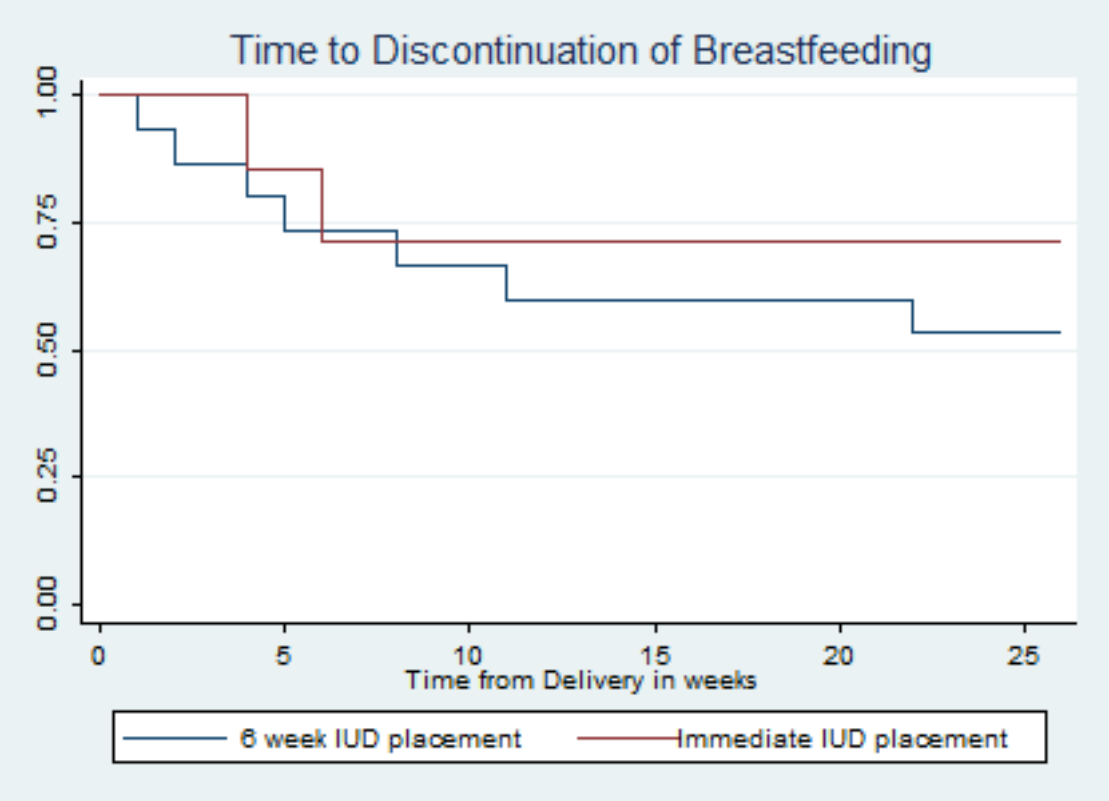
P-values based on Wilcoxon rank-sum tests
* Missing 3 values (1 breastfeeding at 6 weeks and 6months, 2 not breastfeeding at 6 weeks or 6 months)

Table 3:
Breastfeeding status at 6 weeks and 6 months postpartum by timing of IUS insertion

	Immediate IUS Insertion (n=7)	6 week IUS Insertion (n=15)	p
Breastfeeding 6 week postpartum	6 (85.71)	11 (73.33)	1.0
Breastfeeding 6 months postpartum	5 (71.43)	8 (53.33)	.65

P-values based on Fisher's exact tests

Figure 1:
Time to breastfeeding discontinuation by timing of IUS insertion (Kaplan–Meier graph), Log Rank: p=.43



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Appendix

Infant Feeding Intentions Scale[11]

Instructions read to subject: I am going to read to you some statements about feeding your baby. Please choose the answer that most closely matches your opinion, considering both your feeding plans and the likelihood that you will carry out those plans.

	Very Much Agree	Somewhat Agree	Unsure	Somewhat Disagree	Very Much Disagree
1. I am planning to only formula feed my baby (I will not breastfeed at all)	☐	☐	☐	☐	☐
2. I am planning to at least give breastfeeding a try	☐	☐	☐	☐	☐
3. When my baby is 1 month old, I will be breastfeeding without using any formula or other milk	☐	☐	☐	☐	☐
4. When my baby is 3 months old, I will be breastfeeding without using any formula or other milk	☐	☐	☐	☐	☐
5 When my baby is 6 months old, I will be breastfeeding without using any formula or other milk	☐	☐	☐	☐	☐

Item 1 is scored 0 (very much agree) to 4 (very much disagree)
Items 2-5 are scored 4 (very much agree) to 0 (very much disagree)
Total score = (mean of items 1 + 2) + (sum of items 3, 4, 5).

Breastfeeding Self-Efficacy Scale Short-Form[10]

Instructions read to subject: For each of the following statements, please choose the answer that best describes how confident you are with breastfeeding your new baby. Please mark your answer by circling the number that is closest to how you feel. There is no right or wrong answer.

	Not at all confident	Not very confident	Sometimes confident	Confident	Very confident
1. I can always determine that my baby is getting enough milk	☐	☐	☐	☐	☐
2. I can always successfully cope with breastfeeding like I have with other challenging tasks	☐	☐	☐	☐	☐
3. I can always breastfeed my baby without using formula as a supplement	☐	☐	☐	☐	☐
4. I can always ensure that my baby is properly latched on for the whole feeding	☐	☐	☐	☐	☐
5. I can always manage the breastfeeding situation to my satisfaction	☐	☐	☐	☐	☐
6. I can always manage to breastfeed even if my baby is crying	☐	☐	☐	☐	☐
7. I can always keep wanting to breastfeed	☐	☐	☐	☐	☐
8. I can always comfortably breastfeed with my family members present	☐	☐	☐	☐	☐
9. I can always be satisfied with my breastfeeding experience	☐	☐	☐	☐	☐
10. I can always deal with the fact that breastfeeding can be time consuming	☐	☐	☐	☐	☐
11. I can always finish feeding my baby on one breast before switching to the other breast	☐	☐	☐	☐	☐
12. I can always continue to breastfeed my baby for every feeding	☐	☐	☐	☐	☐
13. I can always manage to keep up with my baby's breastfeeding demands	☐	☐	☐	☐	☐
14. I can always tell when my baby is finished breastfeeding	☐	☐	☐	☐	☐

Items are scored 1 (not at all confident) to 5 (very confident) and summed for total score